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DIAMETER GROWTH OF YOUNG PONDEROSA PINE TREES IN THE INLAND EMPIRE

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Foresters often need a means of predicting diameter growth of trees for such purposes as calculating ingrowth, planning thinning schedules, predicting yields of specific products, and predicting quality growth.

The three tables presented here are designed to predict future 10-year diameter growth of young ponderosa pine trees. They are based on data gathered in the Inland Empire and used in the preparation of cubic-foot growth tables.[1] They were not published with the original report because their usefulness was not fully realized at that time. These diameter growth tables are presented here as a supplement to the earlier report, with the belief that they will fill a need. The data are based on increment core measurements for the decade 1939-1948 on about 5,000 trees, using an analytical procedure developed by Gevorkiantz and Olsen.[2]

USE OF THE TABLES

Increment core measurements showed that diameter growth by size and age classes did not vary appreciably by site except over broad classes; this was true for cubic-foot growth also. Accordingly, three tables are shown: table 1 for site class II and better; table 2 for site classes III, IV, and V; and table 3 for site class VI and poorer. Stocking differences are "built into" the tables by virtue of the age and diameter variables.

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[1] Lynch, Donald W. 1954. Growth of young ponderosa pine stands in the Inland Empire. U. S. Forest Service, Intermountain Forest and Range Expt. Sta. Research Paper 36, 16 pp., illus. (Processed.)

[2] Gevorkiantz, S. R., and Lucille P. Olsen. 1948. An improved increment-core method for predicting growth of forest stands. U. S. Forest Service, Lake States Expt. Sta. Station Paper 12, 19 pp. (Processed.)

Close comparison of the tables reveals that certain combinations of diameter and age show higher predicted growth on poor sites than on good. This apparent paradox exists for two reasons: First, small trees of an advanced age normally are not found on good sites. If present, they are suppressed or damaged and their current growth rate is slow. The same size trees of similar age on a poor site are likely to be average trees maintaining reasonably good growth. Second, large trees of a young age are not normally found on poor sites. If present, they are unusually thrifty trees, probably open-grown and increasing in diameter faster than the average tree for that site. On the other hand, that same combination of age and size on a good site could reasonably be an average tree adding only average growth. It is evident, then, that comparisons of individual tree growth between sites is meaningless until actual measurements of dominant and codominant trees from different sites are entered in the table and the growth predictions derived.

Use of the tables requires knowledge of the age and diameters of the trees in question together with the broad site classification. Site can be read from figure 1 by entering the average height and age of a few dominant and codominant trees from the area.

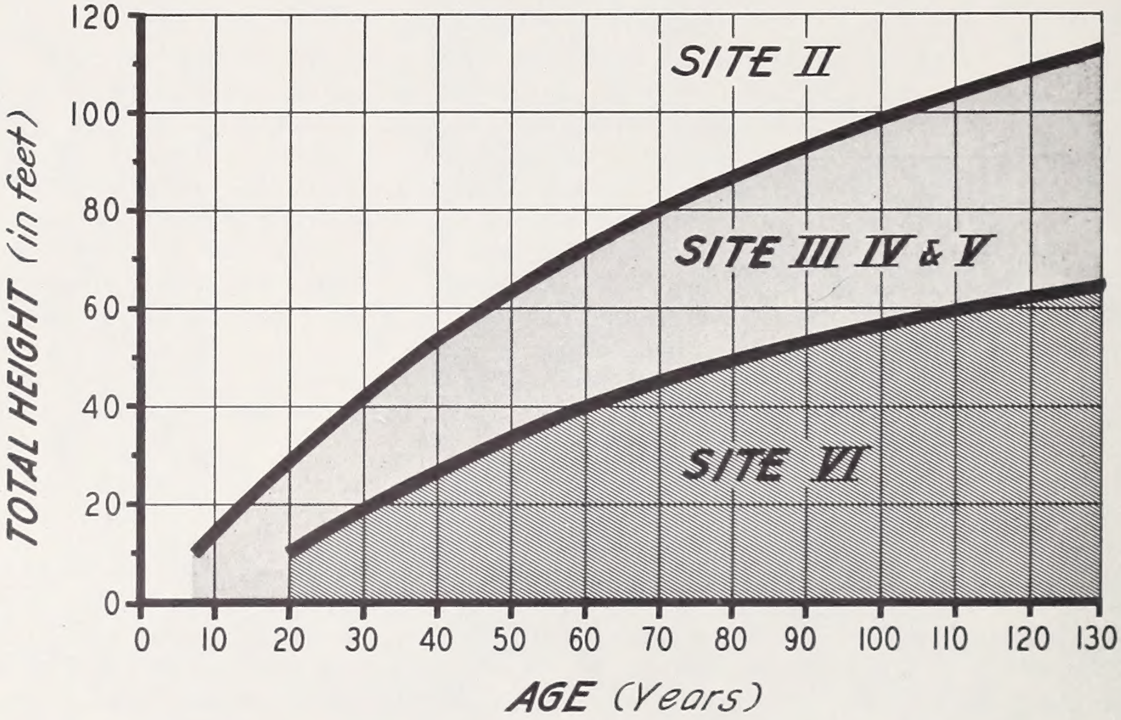

Figure 1.--Height of dominant and codominant trees of average breast-high diameter by site groups. (After Meyer, Walter H. 1938. Yield of even-aged stands of ponderosa pine. U. S. Dept. Agr. Tech. Bul. 603, 60 pp., illus.)

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Table 1.--Site II or better. Future 10-year diameter growth

D.b.h.	Age in years															
	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Inches								Inches								
3	.96	.68	.54	.44	.35											
4	1.52	1.02	.80	.66	.54	.47	.40									
5	2.38	1.45	1.12	.92	.75	.65	.55	.49	.45							
6		2.06	1.52	1.20	.98	.84	.74	.64	.58	.52	.46	.42	.40			
7		2.86	2.00	1.53	1.22	1.05	.92	.79	.72	.64	.58	.52	.49	.46		
8			2.58	1.94	1.54	1.30	1.12	.96	.86	.77	.70	.64	.59	.54	.49	.46
9				2.44	1.88	1.57	1.33	1.15	1.02	.92	.83	.76	.69	.63	.57	.54
10				3.00	2.30	1.87	1.58	1.36	1.20	1.06	.97	.87	.79	.73	.66	.63
11					2.76	2.21	1.85	1.57	1.40	1.22	1.12	.99	.90	.84	.76	.72
12						2.60	2.15	1.82	1.60	1.40	1.27	1.13	1.02	.95	.87	.82
13						3.06	2.48	2.10	1.82	1.60	1.44	1.28	1.16	1.06	.98	.92
14							2.83	2.39	2.06	1.80	1.62	1.44	1.30	1.18	1.09	1.02
15							3.20	2.70	2.32	2.03	1.81	1.60	1.46	1.31	1.21	1.14
16								3.02	2.60	2.28	2.02	1.77	1.61	1.46	1.34	1.24
17								3.38	2.88	2.54	2.23	1.96	1.78	1.62	1.48	1.36
18									3.18	2.80	2.46	2.16	1.95	1.78	1.62	1.48
19									3.50	3.08	2.69	2.38	2.14	1.94	1.76	1.62
20										3.38	2.94	2.62	2.34	2.12	1.91	1.75
21											3.20	2.86	2.55	2.31	2.07	1.90
22												3.13	2.77	2.52	2.25	2.05
23												3.41	3.00	2.73	2.44	2.22
24													3.26	2.96	2.64	2.39
25														3.20	2.85	2.57
26															3.10	2.75
27															3.32	2.94
28																3.14

Table 2.--Sites III, IV, and V. Future 10-year diameter growth

D.b.h.	Age in years															
	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Inches								Inches								
2	1.07	.62	.35	.30												
3	2.09	1.10	.68	.53	.39											
4		1.70	1.06	.78	.59	.47	.40	.34								
5		2.48	1.48	1.05	.80	.63	.53	.45	.40	.37	.33					
6			1.97	1.36	1.03	.80	.67	.58	.51	.46	.42	.37	.35	.34	.31	
7			2.56	1.72	1.27	.99	.83	.70	.63	.57	.52	.47	.43	.41	.38	.36
8			3.31	2.13	1.55	1.20	.99	.84	.75	.67	.61	.56	.52	.49	.45	.42
9				2.59	1.86	1.43	1.18	.99	.88	.79	.72	.66	.60	.57	.53	.49
10				3.13	2.20	1.68	1.38	1.15	1.01	.91	.83	.76	.70	.65	.60	.56
11					2.58	1.96	1.59	1.33	1.16	1.04	.94	.87	.79	.74	.68	.64
12					3.03	2.24	1.82	1.52	1.32	1.17	1.07	.98	.89	.83	.76	.71
13						2.56	2.07	1.71	1.49	1.32	1.20	1.09	1.00	.92	.85	.79
14						2.90	2.34	1.91	1.67	1.48	1.33	1.21	1.11	1.02	.94	.88
15							2.61	2.15	1.86	1.65	1.48	1.34	1.23	1.12	1.04	.97
16							2.91	2.38	2.06	1.82	1.63	1.48	1.35	1.24	1.14	1.06
17								2.62	2.26	2.00	1.79	1.62	1.47	1.35	1.24	1.15
18								2.89	2.48	2.19	1.95	1.76	1.60	1.47	1.35	1.25
19									2.71	2.39	2.12	1.91	1.74	1.59	1.47	1.36
20									2.95	2.59	2.29	2.06	1.88	1.71	1.58	1.46
21										2.81	2.50	2.23	2.03	1.84	1.70	1.57
22											2.70	2.41	2.18	1.97	1.83	1.69
23											2.91	2.60	2.35	2.14	1.95	1.80
24												2.79	2.52	2.29	2.10	1.93
25													2.71	2.46	2.24	2.05
26														2.63	2.39	2.19

Table 3.--Site VI or poorer. Future 10-year diameter growth

D.b.h.	Age in years														
	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Inches							Inches								
2	1.40	.70	.42												
3		1.60	.86	.58	.42										
4			1.48	.95	.69	.51	.40								
5				1.41	1.00	.74	.57	.47							
6				2.08	1.36	1.00	.77	.63	.52	.45					
7					1.86	1.31	1.00	.81	.68	.58	.52	.48			
8						1.67	1.27	1.01	.84	.72	.65	.59	.53	.49	.45
9						2.08	1.57	1.23	1.02	.87	.79	.71	.63	.59	.54
10							1.91	1.49	1.22	1.04	.94	.84	.75	.70	.64
11							2.30	1.76	1.44	1.24	1.10	.98	.88	.81	.74
12								2.06	1.68	1.43	1.27	1.13	1.02	.94	.86
13									1.94	1.64	1.45	1.30	1.18	1.07	.99
14									2.24	1.89	1.65	1.48	1.33	1.22	1.12
15										2.17	1.88	1.68	1.49	1.38	1.26
16											2.15	1.89	1.67	1.54	1.40
17												2.12	1.88	1.71	1.55
18													2.13	1.90	1.71
19														2.09	1.88
20														2.30	2.07
21															2.28